

struction are based, so that each may judge of the extent to which it is trustworthy.

Perhaps the most interesting real novelty is a small skeleton from the Middle Eocene of Wyoming, determined by Prof. Osborn to belong to a primitive armadillo. Fragments of this animal were obtained some years ago by Dr. J. L. Wortman, and ascribed by him to a Lemuroid under the name of *Meta-cheiromys*. Four good specimens now seem to show that it is truly an armadillo, differing chiefly from the typical existing armadillos in "the probable presence of a leathery instead of a bony shield, of an enamel covering on the single large caniniform teeth in the upper and lower jaws and the degeneration of other teeth." This discovery confirms the suppositions of Marsh, Wortman, and Schlosser as to the existence of *Edentata* in North America in the Eocene period;

of origin. He thinks that "in Europe, on one side of this centre, in America, on the other side, we have parallel series of approximate phylogenies; sometimes closer in the one country, sometimes in the other." Until the early Tertiary mammalia of northern Asia are discovered, we cannot advance much further towards real origins.

Prof. Osborn and his associates are indeed to be congratulated on the wide import of the work they have done, and the excellent manner in which it is published. We would commend it to the notice of all students of biology.

A. S. W.

EXPERIMENTS ON AIR RESISTANCE.

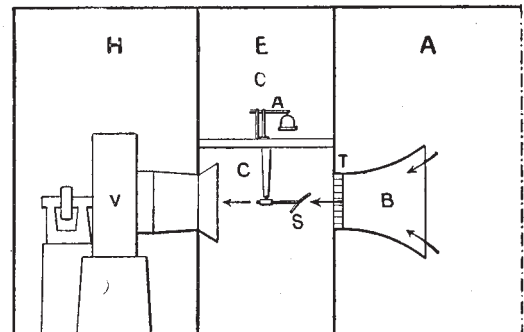
IN *La Nature* (February 26) there is a description by M. Fournier of the new laboratory which M. Eiffel recently erected for the purpose of carrying out his researches on the air resistance of plates and models, more especially with reference to the solution of problems in *aéronautics*.

It will be remembered that M. Eiffel's earlier experiments were made on plates and models let fall from the second stage of the Eiffel Tower. The general agreement of his results on flat plates with those obtained by Mr. Dines on a whirling table and those at the National Physical Laboratory in a current of air was shown in the curves

illustrating the present writer's article on the subject of wind pressure in *NATURE* of May 28, 1908. As this method was not suitable for the rapid determination of centres of pressure, and the "lift" and "drift" of inclined plates, M. Eiffel has now commenced experiments in a

current of air, and the manner in which this current is maintained presents some novel and interesting features. Hitherto, experiments by this method have

been carried out by suspending the models in a long channel with parallel sides through which air was drawn by means of a fan. This arrangement is open to two objections—(1) the difficulty of maintaining the velocity of the current uniform across the channel, and (2) the limited size of the models which could be used without an appre-



ciable effect on the resistance due to the walls of the channel. The first difficulty is overcome by introducing resistances to the flow where necessary, which is a long and tedious process, and the second by limiting the size of the models to within two or three per cent. of the area of the channel. The novelty of M. Eiffel's method consists in his using a comparatively short channel, and in suspending his models in a closed

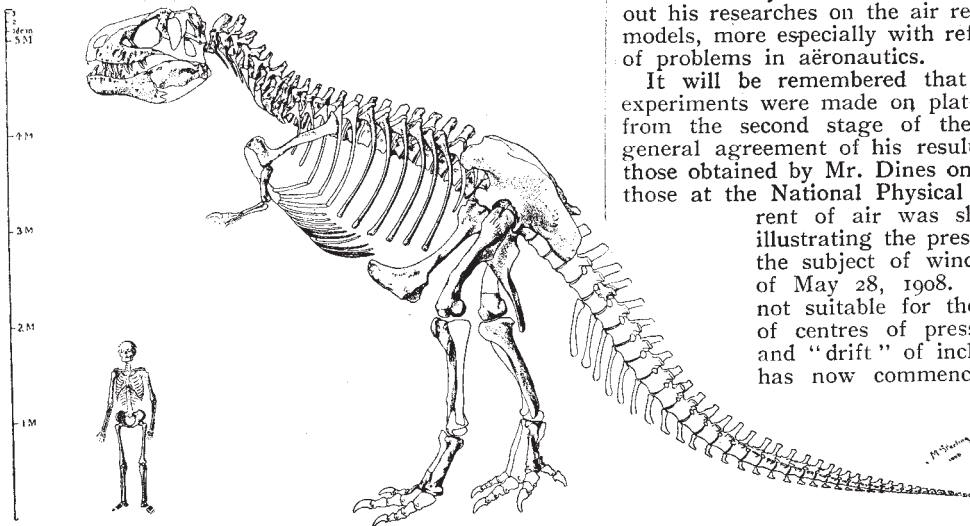


FIG. 2.—Restoration of *Tyrannosaurus rex*. From the type skeleton, American Museum of Natural History.

and it adds to the difficulties of understanding the early Tertiary mammal faunas of South America.

Another astonishing discovery is that of a colossal carnivorous Dinosaur, *Tyrannosaurus* (Fig. 2), from the Upper Cretaceous (Laramie formation) of Wyoming and Montana. It has hitherto been supposed that the flesh-eaters were all much smaller than the largest vegetable-feeders among Dinosaurs; but here is a reptile like *Megalosaurus*, with a skull from 4 to 5 feet in length, and when standing on its heavy hindquarters reaching a height of from 16 to 17 feet. Another new herbivorous Dinosaur, *Ankylosaurus*, from the same geological formation, measures 14 feet in length, and is armoured like the South American *Glyptodonts*.

The technical papers on remains of horses and rhinoceroses, by Prof. Osborn and others, and on camels and deer, by Dr. Matthew, are of extreme scientific value. The discussion of the extinct horses is especially exhaustive, and the result is that it becomes impossible at present to recognise any exact genetic series. Mr. Gidley even remarks that "there is a considerable phyletic hiatus between the groups of the *Equidæ*, which are as yet not bridged over by intermediate forms"; and he adds that this hiatus is particularly marked between the *Anchitherium*-group and the *Protohippus*-group, which "greatly overlap each other in time." Dr. Matthew's explanation of most of our difficulties in understanding the evolution of the European and North American Tertiary mammalia is that northern Asia was their actual place

chamber which constitutes an enlargement of the channel.

The general arrangements will be clear from the diagrammatic sketch in the figure. C is the observation chamber, which is air-tight, and provided with a platform for carrying the observer and the necessary measuring appliances. B is the bell-mouthed air inlet, which is provided with a series of guide plates of honeycomb section on the delivery side to ensure that the air enters the chamber in parallel filaments. V is the outlet and suction fan. S is the model under test, connected to the weighing beam at A.

The advantages of this method as regards simplicity, comparative cheapness of construction, and convenience in making the observations are obvious, and in respect of its accuracy it is claimed that, using the results of M. Eiffel's earlier experiments on falling plates as data, a complete check has been afforded by the results obtained in the new apparatus. It may be doubted, however, if the accuracy of this method is so great as that obtained in a carefully designed parallel channel, for there can hardly fail to be a disturbance of the stream lines due to the sudden enlargement at the inlet similar to that observed in the flow of water. From a curve published in the article, it appears that plates as large as 90 cm. by 15 cm. have been used in a current drawn from an inlet 150 cm. in diameter. According to the writer's experience with this method, the apparent pressure for normal impingement of the current on a plate the area of which is the same fraction of that of the inlet as in the examples cited would be about 10 per cent. in excess of its true value, but in the case of small inclinations, which is, of course, relatively more important in aeronautical work, the error would be much smaller, and possibly of the same order of magnitude as those incurred in the estimations of the velocity of the current. In this branch of aeronautics valuable results may be expected from M. Eiffel's researches.

T. E. STANTON.

C. H. GREVILLE WILLIAMS, F.R.S.

CHARLES HANSON GREVILLE WILLIAMS was born at Cheltenham, September 22, 1829, the son of S. Hanson Williams, a solicitor; his death occurred on June 15, 1910. He commenced his professional career as first assistant to Prof. Anderson, of Glasgow University; after some years spent in research work he moved to Edinburgh, where he conducted a tutorial class under Dr. Lyon Playfair. From 1857 to 1859 he was lecturer on chemistry in the Normal College, Swansea. In 1859 he returned to Glasgow as chemist to the works of Messrs. Miller, chemical manufacturers. He migrated to Greenford Green in 1863, remaining with Messrs. Perkin until 1868. About that year he entered into partnership with M. Edouard Thomas, at the Star Chemical Works, Brentford, the firm being makers of coal-tar colours, and subsisting until 1877. Mr. Greville Williams about this time gave up his connection with manufacturing chemistry and became photometric supervisor to the Gas Light and Coke Company, with whom he remained until 1901, then retiring into the country, where he seldom saw his old friends and acquaintances, but was much interested in the study of the ancient Egyptian language and the translation of inscriptions. Until rheumatism disabled him he was an expert draughtsman and calligraphist, a fair game shot, and an enthusiastic angler. Although in reality a charming companion, with unusual conversational powers, and a keen appreciation of literary and artistic culture, Greville Williams possessed a very modest and retiring disposition, and

became, especially of late years, an almost complete recluse. He was more nervous about his state of health than he need have been, and, in consequence, cut himself off unnecessarily from scientific and social intercourse. This isolation was also due, no doubt, in part to his straitened circumstances, which necessitated strict economy and debarred him from the continuance of his scientific researches—hard lines for a thorough enthusiast; and such he was, possessed, moreover, with the true chemical instinct and a general scientific aptitude. It is a pity that the genius for investigation which was shown in his researches on isoprene, on beryl, and on the bases from bituminous shale, from the Boghead mineral, and from the destructive distillation of cinchonine, did not develop in accordance with more modern methods in his later years. But he made many interesting discoveries, and has left a considerable record of thoroughly sound work.

Greville Williams was elected F.R.S. in June, 1862. He outlived the rest of the distinguished "fifteen" of that year. It was in 1862 also that he joined the Chemical Society. He contributed a number of papers to the publications of these societies, as well as many notes to the *Chemical News*, and also wrote articles for Ure's Dictionary and for Watts's Dictionary, as well as for the *Journal of Gas Lighting*. His chief literary work was "A Handbook of Chemical Manipulation" (Van Voorst, 1857); a supplement appeared in 1879.

On November 25, 1852, Greville Williams married Henrietta Bosher; she died on February 16, 1904. One son and three daughters survive.

The writer of this notice has lost a friend of nearly sixty years' standing—a friend of rare quality and of high Christian character.

A. H. C.

NOTES.

WE announce with deep regret the death, on Monday last at Milan, at the age of seventy-five years, of Prof. G. V. Schiaparelli, Foreign Member of the Royal Society.

THE death (on June 12) is announced of Dr. W. H. Seaman, professor of chemistry in Harvard University, at the age of seventy-three years.

WE regret to announce the death, on July 4, of Mr. R. Russell, I.S.O., who was for thirty-six years connected with the administration of education in Natal. In 1877 he became Superintendent of Education, and retired in 1903.

AT the general monthly meeting of the members of the Royal Institution, held on Monday last, it was announced that the King has consented to become Patron of the institution.

THE Janssen prize of the Paris Academy of Sciences has been awarded to Prof. W. W. Campbell, director of the Lick Observatory, University of California.

SIR J. J. THOMSON, F.R.S., has been elected president of the Junior Institution of Engineers, in succession to Sir H. J. Oram, K.C.B.

DR. F. A. BATHER, F.R.S., has been appointed by the trustees to represent the British Museum (Natural History) at the forthcoming International Geological Congress in Stockholm.

THE Cullen Victoria Jubilee prize has been awarded by the Royal College of Physicians of Edinburgh to Dr. R. W. Philip, for his work on tuberculosis. The prize is awarded once in every four years for the "most important contribution to practical medicine."